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Publications of the Exobiology Program for 1981

A Special Bibliography

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INTRODUCTION

The Exobiology Program, within the Office of Space Science and Applications of the National Aeronautics and Space Administration, is the first and only integrated program to methodically investigate the planetary events which may have been responsible for, or related to, the origin, evolution, and distribution of life in the universe. Research supported by this program is divided into the areas listed below:

Chemical Evolution: The non-biological synthesis of biologically significant organic molecules under conditions presumed to have existed on the primitive earth or any primitive planet before the advent of life.

Organic Geochemistry: Analysis of ancient terrestrial rocks for organic molecules and inclusions of biological origin. The development of techniques for the isolation of organic matter and distinguishing organic matter of biological origin from that of non-biological origin.

Origin and Evolution of Life: Studies of the origin of essential life processes and systems including the nucleic acid and protein biopolymers, genetic information transfer, energy collection mechanisms, and cellular and sub-cellular structures. Understanding the evolution of primitive microbial ecologies.

Planetary Environments: Research dealing with characterization of microorganisms capable of surviving and/or growing in extreme conditions approaching those of planetary environments, development of methodologies and techniques for detection and characterization of life-related molecules in extraterrestrial environments, and development of methods for determination of planetary environmental characteristics important for chemical evolution processes.

Life in the Universe: Research and analysis in three distinct but related areas relevant to life in the universe: forms, abundances and reactivity of the biogenic elements; effect of planetary, solar and astrophysical phenomena on evolution of complex life; and search for extraterrestrial intelligent life by detection of signals in the microwave region of the spectrum.

Planetary Protection: Environmental protection of planets of biological interest against potential harmful contamination from terrestrial sources, which might occur during the course of future exploration, following explicit guidelines established for each planet, as well as protection of the Earth from hazards posed by returned sample missions.

Mars Data Analysis: Research directed toward simulation and interpretation of data from the Mars Viking Landers' organic analysis and biology instruments. To develop models for the unusual reactivity exhibited by the Martian soil.

The arrangement of references in this bibliography follows the division of research described above. Articles are listed alphabetically by author under the research area with which they are most closely related. Only those publications which resulted from research supported by the Exobiology Program and which bear a 1981 publication date have been included. Abstracts, theses, and oral presentations are not included because of their preliminary nature or the frequent difficulty in obtaining them.

Our intent in compiling this bibliography is twofold. First, we would like to provide the scientific community with an annual listing, which began in 1975, of current publications resulting from research pursued under the auspices of NASA's Exobiology Program. Secondly, we hope to stimulate the exchange of information and ideas among scientists working in the different areas of the program. To facilitate the exchange process, we have identified for each publication, by asterisk, the author participating in the program. Current addresses for all principal investigators are given in the Appendix.

We wish to thank all the participants in the Exobiology Program for their cooperative response to our request for a listing of 1981 publications.

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